PATENT ABSTRACTS OF JAPAN

(11)Publication number : 11-254945
(43)Date of publication of application : 21.09.1999

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(51)Int.Cl. B60H 1/00
B60H 1/00

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(21)Application number : 10-074838
(22)Date of filing : 09.03.1998
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(54) VEHICLE AIR-CONDITIONING DEVICE

(57)Abstract:

PROBLEM TO BE SOLVED: To efficiently prevent a deficiency caused by radiant heat from a dashboard and a windshield.

SOLUTION: When the temperature of a dashboard exceeds a predetermined value, the dashboard is cooled by a dashboard-cooling means, and when a windshield is cooled by a windshield cooling means. The dashboard cooling means is composed of a bypass passage extending along the side surface of the lower part of the dashboard, and the windshield cooling means is obtained by a defogging vent blow-out mode in which a defogging vent blow-out port is opened if the temperature of the front shield becomes higher than a predetermined temperature during the defogging vent blow-out mode in which the vent blow-out port is opened.

LEGAL STATUS

[Date of request for examination]	07.10.2004
[Date of sending the examiner's decision of rejection]	
[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]	
[Date of final disposal for application]	
[Patent number]	
[Date of registration]	
[Number of appeal against examiner's decision of rejection]	
[Date of requesting appeal against examiner's decision of rejection]	
[Date of extinction of right]	

引用文献4

(19)日本国特許庁（ＪＰ）　(12)公開特許公報（Ａ）　(11)特許出願公開番号

特開平11－254945

(43)公開日　平成11年(1999)９月21日

(51)Int.Cl.^{6}	識別記号	ＦＩ		
B60H　1/00	102	B60H　1/00	102	M
			102	U
	101		101	F

審査請求　未請求　請求項の数７　ＦＤ　（全８頁）

(21)出願番号　特願平10－74838

(22)出願日　平成10年(1998)３月９日

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(54)【発明の名称】車両用空調装置

(57)【要約】

【課題】　ダッシュボードとフロントガラスからの輻射熱による不具合を効率よく防止する。

【解決手段】　ダッシュボードの温度が所定温度以上となった場合にダッシュボード冷却手段によってダッシュボードを冷却すると共に、フロントガラスの温度が所定温度以上となった場合に、前記フロントガラス冷却手段によってフロントガラスを冷却する。前記ダッシュボード冷却手段は、ダッシュボードの下部側面に沿って延設されるバイパス通路であり、前記フロントガラス冷却手段は、ベント吹出口を開口するベント吹出モード時に前記フロントガラスの温度が所定温度以上となった場合、デフ吹出口を開口するデフベント吹出モードである。

【特許請求の範囲】

【請求項１】　フロントガラスの車室内側下部近傍のダッシュボードに開口するデフ吹出口と、前記ダッシュボードの乗員側側面に開口するベント吹出口とを少なくとも具備し、ダクト内に冷却用熱交換器、加熱用熱交換器及び加熱用熱交換器を流れる空気とバイパスする空気に分流するミックスドアとを有する車両用空調装置において、

前記ダッシュパネルの温度が所定温度以上となった場合に前記ダッシュパネルを冷却するダッシュパネル冷却手段と、

前記フロントガラスの温度が所定温度以上となった場合に、前記フロントガラスを冷却するフロントガラス冷却手段とを具備することを特徴とする車両用空調装置。

【請求項２】　前記ダッシュパネル冷却手段は、前記冷却用熱交換器の下流側近傍のダクトに開口する開口部からダッシュパネルの下部側面に沿って前記ダクトの下流側に開口する開口部まで延設されるバイパス通路であり、前記ダッシュパネルの温度が所定温度以上となった場合に、前記開口部を開閉する開閉手段を開とすることを特徴とする請求項１記載の車両用空調装置。

【請求項３】　前記バイパスドアは、ダッシュボードと車室内温度との間の温度差に応じて開度を変化させる開度制御手段を具備することを特徴とする請求項２記載の車両用空調装置。

【請求項４】　前記フロントガラス冷却手段は、ベント吹出口を開口するベント吹出モード時に、前記フロントガラスの温度が所定温度以上となった場合、デフ吹出口を開口するデフベント吹出モードであることを特徴とする請求項１，２又は３記載の車両用空調装置。

【請求項５】　前記ダッシュパネル冷却手段及び前記フロントガラス冷却手段は、前記デフ吹出口に設けられた駆動手段によって駆動される吹出方向変更ルーバであり、ダッシュパネルの温度が所定温度以上である場合にはダッシュパネルの上部に沿って冷風を吹出す位置に吹出口を移動させ、フロントガラスの温度が所定温度以上である場合にはフロントガラスに沿って冷風を吹出す位置に吹出口を移動させ、ダッシュパネルの温度が所定値以上であり且つフロントパネルの温度が所定値以上である場合には、前記ダッシュパネルに沿って冷風を吹出す位置及び前記フロントガラスに沿って冷風を吹出す位置の間を往復動することを特徴とする請求項１記載の車両用空調装置。

【請求項６】　前記フロントガラス冷房手段は前記ダッシュパネルに形成された第１のデフ吹出口であり、且つ前記ダッシュパネル冷却手段は前記ダッシュパネル側に開口する第２のデフ吹出口であり、前記ダッシュパネルの温度が所定温度以上である場合に切換ドアによって第２のデフ吹出口を開口すると共に第１のデフ吹出口は閉鎖し、前記フロントガラスの温度が所定温度以上である場合には切換ドアによって第１のデフ吹出口を開口すると共に第２のデフ吹出口を閉鎖し、前記ダッシュパネルの温度が所定値以上であり且つ前記フロントパネルの温度が所定値以上である場合には、切換ドアを第１及び第２のデフ吹出口を開口させる位置に移動させることを特徴とする請求項１記載の車両用空調装置。

【請求項７】　前記フロントガラスの側部を保持するＡピラーには、前記サイドガラスに沿って冷風を吹出す複数の吹出口と、該複数の吹出口が連通する冷風通路と、該冷風通路を開閉する開閉手段とによってサイドガラス冷却手段が構成され、前記サイドガラスの温度が所定温度以上になった場合に、前記開閉手段が開くことによって前記冷風通路と前記ダクトの下流側が連通されることを特徴とする請求項１～６のいずれか一つに記載の車両用空調装置。

【発明の詳細な説明】

【０００１】

【発明が属する技術分野】この発明は、車両に搭載される空調装置であって、フロントガラスの内側下方近傍のダッシュボードに開口するデフ吹出口及びダッシュボードの乗員側側面に開口するベント吹出口とを少なくとも有するものに関する。

【０００２】

【従来の技術】特開平５－３３８４３４号公報に開示される車両用空調装置は、ダッシュボードの上面に開放孔を開放し、この開放孔に開閉可能な開閉ダンパを設け、目標吹出温度が所定の温度範囲内にある場合に、エバポレータ直後の冷風を前記開放孔から吹出すようにし、ダッシュボードの上面を冷却してダッシュボードからの輻射熱を低減するようにしたものである。この開放孔から吹出される冷風は、該公報の図４からも明らかなように冷風はダッシュボードの表面に沿って車両進行方向に対して垂直方向に吹出されるものである。

【０００３】特開平５－１８５８２７号公報に開示される自動車の空気調和装置は、空気冷却手段のエバポレータとそこで冷却された低温空調気を分割手段に送るダクトとを、車内の天井又は内側面に備えた冷輻射パネル内に配して空気冷却手段兼冷輻射パネルを構成し、冷輻射パネルから低温を輻射するようにしたものである。

【０００４】

【発明が解決しようとする課題】しかしながら、インパネ、ダッシュボード等は、反射やデザインの関係から黒、グレー等の濃色系が使用される場合が多く、またフロントガラスが直射日光の低減に用いられる熱線吸収ガラスにより形成される場合には、フロントガラスの温度も日射により上昇する。これによって、ダッシュボードやフロントガラスからの輻射熱によって、車室内の空気温度は適温であり、直射日光があっていない場合でも、乗員は暑さや顔の火照りを感じるという不具合がある。

【０００５】この不具合に対して、特開平５－３３８４

３４号公報に開示される車両用空調装置は、ダッシュボードの冷却は可能となるもののフロントガラスの冷却は不可能であり、特開平５－１８５８２７号公報に開示される冷輻射パネルでは、ダッシュボード及びフロントガラスからの輻射熱による不具合を防止できないものである。

【０００６】よって、この発明は、ダッシュボードとフロントガラスからの輻射熱による不具合を効率よく防止することのできる車両用空調装置を提供することにある。

【０００７】

【課題を解決するための手段】したがって、この発明は、フロントガラスの車室内側下部近傍のダッシュボードに開口するデフ吹出口と、前記ダッシュボードの乗員側側面に開口するベント吹出口とを少なくとも具備し、ダクト内に冷却用熱交換器、加熱用熱交換器及び加熱用熱交換器を流れる空気とバイパスする空気に分流するミックスドアとを有する車両用空調装置において、前記ダッシュボードの温度が所定温度以上となった場合に前記ダッシュボードを冷却するダッシュボード冷却手段と、前記フロントガラスの温度が所定温度以上となった場合に、前記フロントガラスを冷却するフロントガラス冷却手段とを具備することにある。

【０００８】よって、この発明によれば、ダッシュボードの温度が所定温度以上となった場合にダッシュボード冷却手段によってダッシュボードを冷却すると共に、フロントガラスの温度が所定温度以上となった場合に、前記フロントガラス冷却手段によってフロントガラスを冷却することができるので、フロントガラス及びダッシュボードからの輻射熱を防止することができるものである。尚、この場合、前記ダッシュボードの温度及びフロントガラスの温度は、直接温度センサを装着することによって検出しても良いし、空調制御を行うために検出される各種検出信号、例えば車室内温度、外気温度及び日射量から演算するようにしても良いものである。その演算方法は、実験より求められることが望ましい。

【０００９】また、前記ダッシュボード冷却手段は、前記冷却用熱交換器の下流側近傍のダクトに開口する開口部からダッシュボードの下部側面に沿って前記ダクトの下流側に開口する開口部まで延設されるバイパス通路であり、前記ダッシュボードの温度が所定温度以上となった場合に、前記開口部を開閉する開閉手段を開とするものである。

【００１０】これによって、ダッシュボードの温度が所定温度以上となった場合に、バイパス通路が開閉手段により開放されるので、冷却用熱交換器の下流側から冷風がバイパス通路に流れるため、ダッシュボードの下方からダッシュボードを冷却することができるものである。この場合、ダッシュボードを冷却した際に冷風の温度が上昇し、この冷風がダクト内にて主流の冷風と混合されることから、目標吹出空気温度の設定においてバイパス通路を通過する空気の熱交換率が加味されることが望ましい。

【００１１】さらに、前記バイパスドアは、ダッシュボードと車室内温度との間の温度差に応じて開度を変化させる開度制御手段を具備することが望ましい。これによって、ダッシュボードと車室内温度との間の温度差によるきめの細かい制御が可能となるものである。

【００１２】さらにまた、前記フロントガラス冷却手段は、ベント吹出口を開口するベント吹出モード時に前記フロントガラスの温度が所定温度以上となった場合、デフ吹出口を開口するデフベント吹出モードであってもよいものである。これによって、フロントガラスが所定温度以上となった場合には、通常の冷房運転時において、閉鎖されるデフ吹出口を開口するようにしたことによって、ベント吹出口から吹出される冷風がデフ吹出口から吹出されるために、フロントガラスの冷却が可能となるものである。

【００１３】また、前記ダッシュボード冷却手段及び前記フロントガラス冷却手段は、前記デフ吹出口に設けられた駆動手段によって駆動される吹出方向変更ルーバであり、ダッシュボードの温度が所定温度以上である場合にはダッシュボードの上部に沿って冷風を吹出す位置に吹出口を移動させ、フロントガラスの温度が所定温度以上である場合にはフロントガラスに沿って冷風を吹出す位置に吹出口を移動させ、ダッシュボードの温度が所定値以上であり且つフロントパネルの温度が所定値以上である場合には、前記ダッシュボードに沿って冷風を吹出す位置及び前記フロントガラスに沿って冷風を吹出す位置の間を往復動するであってもよいものである。

【００１４】これによって、フロントガラスのみが所定温度以上である場合にはフロントガラス側にのみ冷風を吹出し、ダッシュボードのみが所定温度以上である場合にはダッシュボード側のみに冷風を吹出し、さらに両者の温度が所定温度以上である場合には、フロントガラス側及びダッシュボード側の間を吹出口が往復するように動作するため、一つの吹出方向変更ルーバにより両者の冷却が可能となるものである。

【００１５】さらに、前記フロントガラス冷房手段は前記ダッシュボードに形成された第１のデフ吹出口であり、且つ前記ダッシュボード冷却手段は前記ダッシュボード側に開口する第２のデフ吹出口であり、前記ダッシュボードの温度が所定温度以上である場合に切換ドアによって第２のデフ吹出口を開口すると共に第１のデフ吹出口は閉鎖し、前記フロントガラスの温度が所定温度以上である場合には切換ドアによって第１のデフ吹出口を開口すると共に第２のデフ吹出口を閉鎖し、前記ダッシュボードの温度が所定値以上であり且つ前記フロントパネルの温度が所定値以上である場合には、切換ドアを第１及び第２のデフ吹出口を開口させる位置に移動させる

物であっても良いものである。

【００１６】さらにまた、前記フロントガラスの側部を保持するＡピラーには、前記サイドガラスに沿って冷風を吹出す複数の吹出口と、該複数の吹出口が連通する冷風通路と、該冷風通路を開閉する開閉手段とによってサイドガラス冷却手段が構成され、前記サイドガラスの温度が所定温度以上になった場合に、前記開閉手段が開くことによって前記冷風通路と前記ダクトの下流側が連通されるものが望ましい。これによって、サイドグラスからの輻射熱も防止することができる。

【００１７】

【発明の実施の形態】以下、この発明の実施の形態について図面により説明する。

【００１８】図１において、車両用空調装置１は、車両２のダッシュボード３内に搭載されるもので、ダッシュボード３の上面であってフロントガラス４の下部近傍に開口するデフ吹出口５、ダッシュボード３の乗員側側面に開口するベント吹出口６、及びダッシュボード３の下方であって乗員の足元近傍に開口するフット吹出口７を有するものである。

【００１９】前記車両用空調装置１は、例えば図２に示すもので、ダクト１０の最上流側に開口する外気導入口１１と内気導入口１２とを有し、さらに外気導入口１１及び内気導入口１２を適宜選択的に開口するインテークドア１３を有するものである。このインテークドア１３の下流には送風機１４が設けられ、この送風機１４の稼動によって、前記インテークドア１３によって選択された外気導入口１１若しくは内気導入口１２から外気若しくは内気が吸引され、前記ダクト１０の下流側に送風されるものである。前記送風機１４の下流には、冷却用熱交換器としてのエバポレータ１５が配され、通過する空気を冷却するようになっている。このエバポレータ１５で冷却された空気は、ミックスドア１７によって加熱用熱交換器としてのヒータコア１６を通過する空気とこのヒータコア１６をバイパスする空気とに分けられ、その下流側で冷却されたままの空気と加熱された空気が混合され、所望の温度の吹出空気が得られるものである。そして、ダクト１０の最下流側には、前記デフ吹出口５、前記ベント吹出口６及びフット吹出口７のそれぞれと連通するダクト５Ａ，６Ａ，７Ａが接続され、それぞれのダクト５Ａ，６Ａ，７Ａを開閉するモードドア１８Ａ，１８Ｂ，１８Ｃが設けられるものである。

【００２０】そして、前記車両用空調装置１には、前記ダッシュボード３の下側面に沿って迂回するバイパス通路２０が設けられる。このバイパス通路２０の一方の開口部２１は前記ダクト１０の前記エバポレータ１５の下流側近傍に開口すると共に、前記バイパス通路２０の他方の開口部２２は前記ミックスドア１７の下流のバイパス側のダクト１０に開口する。また、前記開口部２１，２２の各々には、バイパスドア２３，２４が設けられる。このバイパスドア２３，２４はモータアクチュエータ等によって駆動されることが望ましく、これによって前記バイパス通路２０を通過する冷風量を０％から１００％の間で細かく調整できるものである。

【００２１】以下、本願発明の第１の実施の形態について、図５及び図６のフローチャート図にしたがって説明する。

【００２２】図６で示すフローチャートは、フロントガラス冷却制御に関するもので、車両用空調装置１の制御を実行するメイン制御ルーチンの一部として、若しくはメイン制御ルーチンから定期的に実行されるサブルーチンとして組み込まれるもので、メイン制御ルーチンの流れに沿って定期的に実行されるものである。

【００２３】ステップ１００から開始されるフロントガラス冷却制御において、ステップ１１０において、図１に示すフロントガラス温度検出センサ２０によって検出されるフロントガラス温度Ｔｆｇと車室内温度Ｔｉとの間の温度差が所定値α以上であるか否かが判定される。この判定においてフロントガラス温度Ｔｆｇと室内温度Ｔｉとの温度が所定値α以上でない場合には、フロントガラス４からの輻射熱が大きくないと判断し、ステップ１２０に進んで通常制御のモードが設定されてステップ１８０からメイン制御ルーチンに戻り、特にフロントガラス冷却制御は実行されない。

【００２４】これに対して、ステップ１１０の判定によって、フロントガラス温度Ｔｆｇと室内温度Ｔｉとの温度差が所定値α以上であると判定された場合には、フロントガラス４からの輻射熱によって不快を感じると判断できるため、ステップ１３０に進んで、フロントガラス温度Ｔｆｇと外気温度Ｔａとの温度差が所定値β以上であるか否かが判定される。この判定において、温度差が所定値β以上である判定された場合には、フロントガラス４の温度上昇が外気温度Ｔａよりもかなり高いと判定できるために、ステップ１４０に進んで、デフ吹出口５が開口されてフロントガラス４に沿って冷風が吹出すようにするモードドア１８Ａが開口すると共に、デフ吹出口５から吹出されるデフ吹出空気温度Ｔｄｅｆは、フロントガラス４による熱交換による温度上昇分が加味されて、ベント吹出空気温度Ｔｖｅｎｔよりも所定値β分低い温度が設定されるものである。具体的には、ベント吹出ダクト６Ａを開閉するモードドア１８Ｂとデフ吹出ダクト５Ａを開閉するモードドア１８Ａとの開扉具合及びミックスドア１７の位置とエバポレータ１５の冷却能力の変化によって、デフ吹出ダクト５Ａを通過する空気に含まれる冷風量をベント吹出ダクト６Ａを通過する空気に含まれる冷風量よりも所定値多くすることによってデフ吹出空気温度Ｔｄｅｆをベント吹出空気温度Ｔｖｅｎｔよりも所定値下げることできるものである。これによって、デフ吹出空気温度Ｔｄｅｆは、フロントガラス４との熱交換によって上昇し、ベント吹出温度Ｔｖｅｎｔ

となるものである。そして、ステップ１４０によるフロントガラス冷却制御を実行しつつ、ステップ１８０からメイン制御ルーチンに回帰するものである。

【００２５】また、ステップ１２０の判定においてフロントガラス温度Ｔｆｇと外気温度Ｔａとの温度差が所定値βよりも小さい場合には、ステップ１５０に進んでデフ吹出口５からベント吹出空気と同様の温度Ｔｖｅｎｔに設定された空気を吹出すようにモードドア１８Ａを開扉し、ステップ１６０に進んでフロントガラス温度Ｔｆｇと車室内温度Ｔｉとの温度差が前記所定値αよりも大きい所定値γ以上であるか否かの判定を行う。この判定において前記温度差が所定値γより小さい場合には、ステップ１８０から前記ステップ１５０のフロントガラス冷却制御を実行しつつ、ステップ１８０からメイン制御ルーチンに回帰するものである。これによって、フロントガラス４からの輻射熱Ｆｇを防止することができるものである。

【００２６】また、前記ステップ１６０の判定において、前記温度差が所定値γ以上である場合には、フロントガラス温度Ｔｆｇと車室内空気温度Ｔｉとの温度差が大きいことから、ステップ１７０に進んで、モードドア１８Ａの開度を大きくしてデフ吹出空気の風量を増大させ、ステップ１８０からメイン制御ルーチンに回帰するものである。尚、上記フロントガラス冷却制御において、フロントガラス温度は温度センサ２０によって検出するようにしたが、車室内温度Ｔｉ、外気温度Ｔａ及び日射量に基づいて演算により求めるようにしても良いものである。

【００２７】図７で示すダッシュボード冷却制御は、上記フロントガラス冷却制御と並行して実行されるもので、主にバイパス通路２０に設けられたバイパスドア２３，２４の制御として行われるものである。ステップ２００から開始されるバイパスドア制御は、ステップ２１０において、図１に示す温度センサ１９によって検出されたダッシュボード温Ｔｄと車室内温度Ｔｉの温度差が所定値α’（α’＞α）以上であるか否かの判定が行われる。この判定において、前記温度差が所定値（α’）よりも小さい場合には、ステップ２２０に進んでバイパスドア２３，２４を閉扉し、ステップ２４０からメイン制御ルーチンに回帰するものである。

【００２８】また、前記す２１０の判定において、温度差が所定値α’以上であると判定された場合には、ダッシュボード３からの輻射熱により乗員が不快を感じていると判断できるために、ステップ２３０に進んで前記ダッシュボード温度Ｔｄが室内温度と等しくなるようにバイパスドア２３，２４の制御が実行されるものである。これによってダッシュボード３からの輻射熱Ｆｄを防止することができるものである。

【００２９】図３に示す第２の実施の形態は、前記デフ吹出口に円筒状の吹出方向変更ルーバ３０を設けたものである。この吹出方向変更ルーバ３０は、前記デフ吹出ダクト５Ａと連通する吸入口３２と、モータ等の駆動手段３３によって移動する吹出口３１とを具備するもので、この第２の実施の形態において、図５で示すフロントガラス冷却制御では、前記ステップ１４０若しくはステップ１５０の制御に代えて、吹出方向変更ルーバ３０の吹出口３１を、図３（ｂ）で示されるように、吹出口３１が上方に向くように回動させるものである。これによって、デフ吹出空気は、フロントガラス４の内側に沿って吹き上がり、前記フロントガラス４を冷却するものである。

【００３０】また、この第２の実施の形態において、図７で示すダッシュボード冷却制御では、ステップ２１０の判定においてダッシュボード温度Ｔｄと車室内温度Ｔｉとの温度差が所定値α’以上である場合には、ステップ２３０の制御に代えて吹出方向変更ルーバ３０の吹出口３１の位置を、図３（ａ）で示されるように、吹出口３１がダッシュボー３ドに沿う方向に向くように回動させるものである。これによって、デフ吹出空気は、ダッシュボード３に沿って吹出され、ダッシュボード３を冷却するものである。

【００３１】また、フロントガラス冷却制御とダッシュボード冷却制御が同時に成り立った場合には、前記吹出方向変更ルーバ３０の吹出口３１は、前記図３（ａ）で示す吹出口３１の位置と図３（ｂ）で示す吹出口３１の位置との間を往復動するものである。これによって、前述した第１の実施の形態と同様の効果を奏することができるものである。

【００３２】図４で示す第３の実施の形態は、デフ吹出ダクト５Ａの最下流側を、フロントガラス４側に開口した第１の吹出口５１と、ダッシュボード３側に開口した第２の吹出口５２とに分割すると共に、第１の吹出口５１に至る第１の通路５１Ａと第２の吹出口５２に至る第２の通路５２Ａとを適宜選択的に開閉する開閉ドア５３を設けたものである。これによって、この第３の実施の形態において、図５で示すフロントガラス冷却制御では、前記ステップ１４０若しくはステップ１５０の制御に代えて、第１の吹出口５１のみが開口するように開閉ドア５３が移動するものである。これによって、デフ吹出空気は、フロントガラス４の内側に沿って吹き上がり、前記フロントガラス４を冷却するものである。

【００３３】また、この第３の実施の形態において、図７で示すダッシュボード冷却制御では、ステップ２１０の判定においてダッシュボード温度Ｔｄと車室内温度Ｔｉとの温度差が所定値α’以上である場合には、ステップ２３０の制御に代えて、第２の吹出口５２のみが開口するように開閉ドア５３が移動するものである。吹出方向変更ルーバ３０の吹出口３１の位置を、図３（ａ）で示されるように、これによって、デフ吹出空気は、ダッシュボード３に沿って吹出され、ダッシュボード３を冷

却するものである。

【００３４】また、フロントガラス冷却制御とダッシュボード冷却制御が同時に成り立った場合には、前記開閉ドア５３は第１及び第２の吹出口５１，５２を開口する位置に移動するものである。これによって、前述した第１の実施の形態と同様の効果を奏することができるものである。

【００３５】さらに、上記車両用空調装置１は、図５（ａ），（ｂ）で示すように、ダッシュボード３の両端に位置するサイドベント吹出口６１を有するベント吹出ダクト６Ａの端部と連通するサイドガラス冷却装置を有するものである。このサイドガラス冷却装置は、前記ベント吹出ダクト６Ａと連通する冷風ダクト６２と、前記フロントガラスの側部を保持すると共にドア７１を支持するＡピラー６６のフレームと内装との間に形成された冷風通路６４と、前記Ａピラー６６のサイドガラス７０側に沿って該冷風通路６４に開口する複数の吹出口６５とによって構成されるもので、前記冷風ダクト６２と前記ベント吹出ダクト６Ａとの間を開閉する開閉ドア６３によって吹出制御がなされるものである。

【００３６】また、サイドガラス冷却制御は、図８のフローチャートで示されるように、サイドベント温度制御として実行される。このステップ３００から実行されるサイドベント温度制御は、まずステップ３１０において温度センサによって検出されるか、若しくは演算によって算出されたサイドガラス温度Ｔｓｇと車室内温度Ｔｉとの温度が所定値α以上であるか否かの判定が行われる。この判定において、前記温度差が所定値α以上でない場合には、ステップ３２０に進んで前記開閉ドア６３が閉扉され、通常の制御が設定されて、サイトガラス冷却制御は実行されず、ステップ３６０からメイン制御ルーチンに回帰するものである。

【００３７】さらに、前記ステップ３１０の判定でサイドガラス温度Ｔｓｇと車室内温度Ｔｉとの温度差が所定値α以上である場合には、ステップ３３０に進んでサイドガラス温度Ｔｓｇと外気温度Ｔａとの温度差が所定値β以上であるか否かの判定が行われる。この判定において、前記温度差が所定値β以上であると判定された場合には、ステップ３４０に進んで前記開閉ドア６３が設定されると共に、サイドベント吹出温度Ｔｓｖｅｎｔがベント吹出温度Ｔｖｅｎｔよりも所定値β分低く設定される。これによって、サイドグラス吹出空気の温度は、サイドグラス７０との間で熱交換され、所定の吹出温度Ｔｖｅｎｔとなるものである。

【００３８】また、前記ステップ３３０の判定において、前記温度差が所定値β以上でないと判定された場合には、ステップ３５０に進んで、前記開閉ドア６３が開扉されると共に、サイドベント吹出温度Ｔｓｖｅｎｔがベント吹出温度Ｔｖｅｎｔに設定されるものである。これによって、サイドガラスを冷却できるために、サイドガラスからの輻射熱を防止することができるものである。

【００３９】

【発明の効果】以上説明したように、この発明によれば、ダッシュボード及びフロントガラス、さらにはサイドガラスからの輻射熱による不快感を防止できるので、車室内の空調環境の快適性を向上させることができるものである。また、輻射熱による不快を解消するために、必要以上に室温を下げる必要がなくなるので、省エネを達成できるものである。

【図面の簡単な説明】

【図１】本願発明に係る車両用空調装置の搭載状況及び環境を説明する説明図である。

【図２】本願発明の第１の実施の形態に係る車両用空調装置の概略を示した概略図である。

【図３】本願発明の第２の実施の形態に係る吹出方向切換ルーバの構成を示したもので、（ａ）はダッシュボード冷却制御時の状態を示し、（ｂ）はフロントガラス冷却制御時の状態を示したものである。

【図４】本願発明の第３の実施の形態に係る吹出部近傍の構成を示した説明図である。

【図５】サイドガラス冷却装置の構成を説明したもので、（ａ）はその概略構成図であり、（ｂ）はＡピラー近傍を示した説明図である。

【図６】フロントガラス冷却制御を示すフローチャート図である。

【図７】ダッシュボード冷却制御としてのバイパスドア制御を示すフローチャート図である。

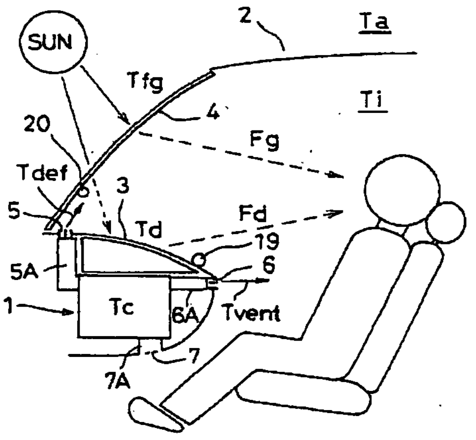
【図８】サイドグラス冷却制御としてのサイドベント温度制御を示すフローチャート図である。

【符号の説明】

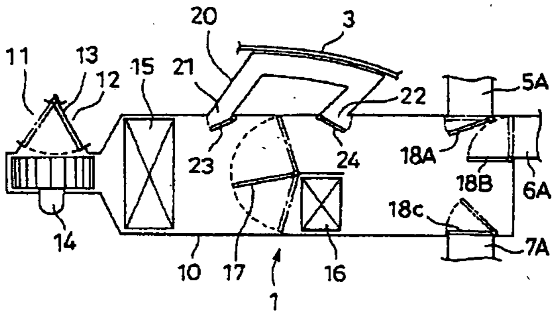
１	車両用空調装置
２	車両
３	ダッシュボード
４	フロントガラス
５	デフ吹出口
６	ベント吹出口
１０	ダクト
１５	エバポレータ
１６	ヒータコア
１７	ミックスドア
１８Ａ，１８Ｂ，１８Ｃ	モードドア
２０	バイパスドア
３０	吹出方向切換ルーバ
５１	第１の吹出口
５２	第２の吹出口
５３	切換ドア
６１	サイドベント吹出口
６２	冷風ダクト
６４	冷風通路

６６　Ａピラー

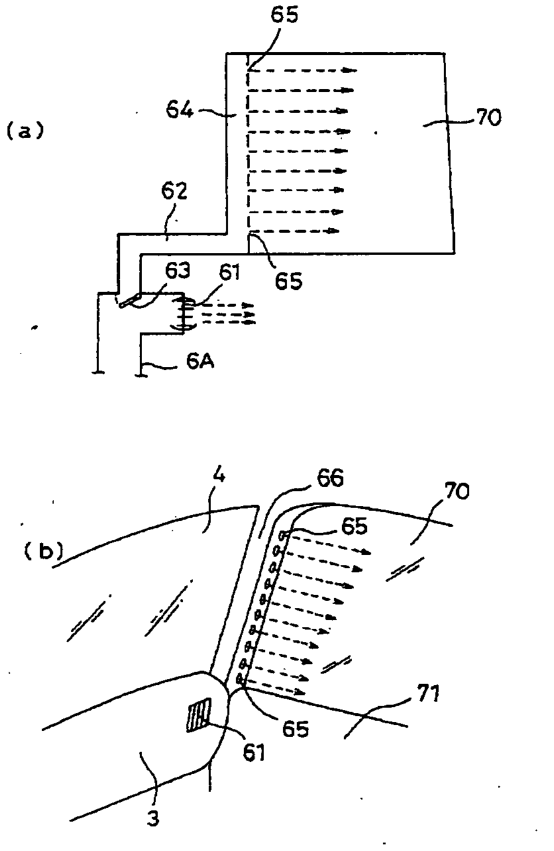
【図１】



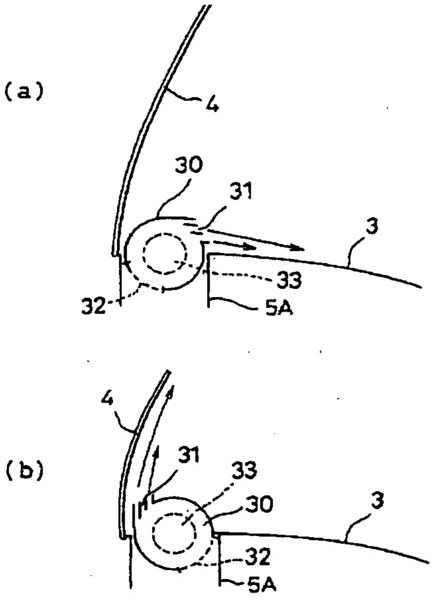
【図２】



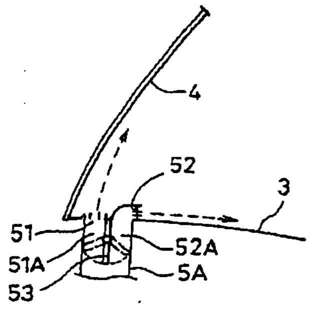
【図５】



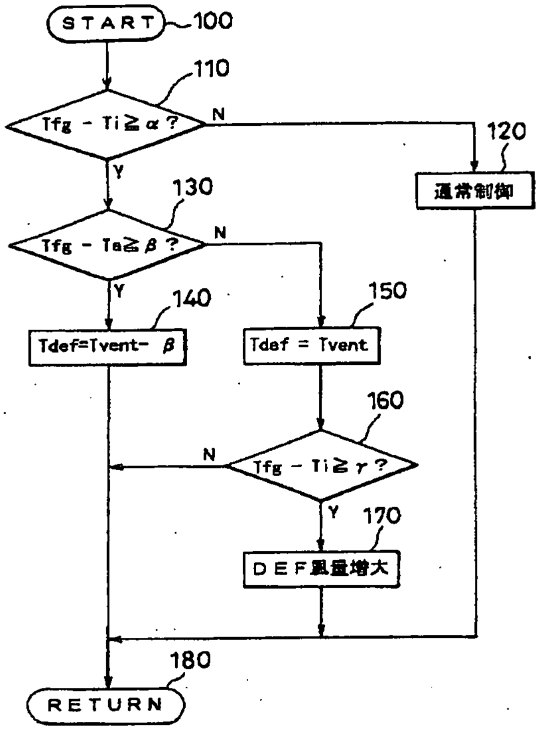
【図３】



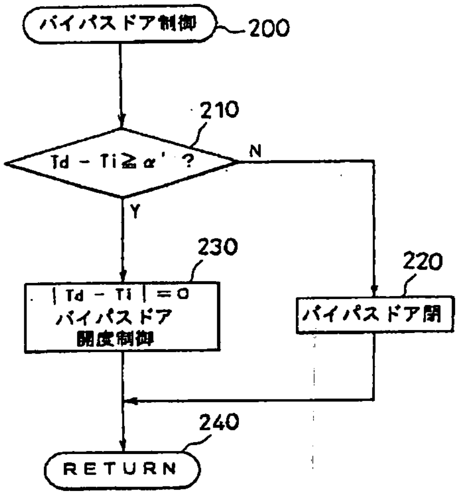
【図４】



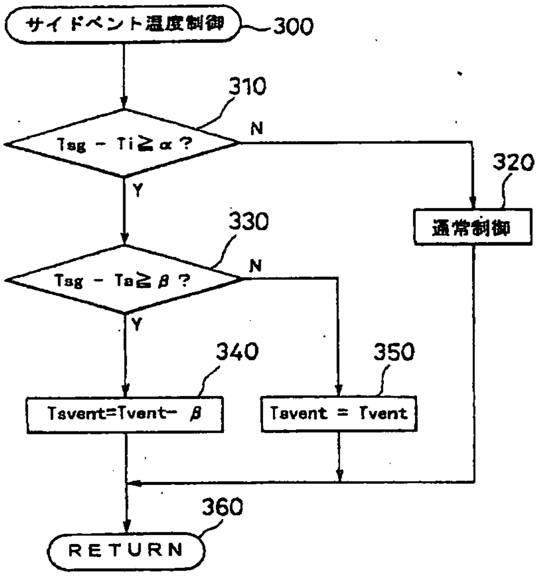
【図６】


START
100
110
Tfg - Ti ≧ α ?
N
Y
120
通常制御
130
Tfg - Ta ≧ β ?
N
Y
140
Tdef=Tvent- β
150
Tdef = Tvent
160
N
Tfg - Ti ≧ γ ?
Y
170
DEF風量増大
180
RETURN

【図７】


バイパスドア制御
200
210
Td - Ti ≧ α' ?
N
Y
230
|Td - Ti|=0
バイパスドア
開度制御
220
バイパスドア閉
240
RETURN

【図８】


サイドベント温度制御
300
310
Tsg - Ti ≧ α ?
N
Y
320
通常制御
330
Tsg - Ta ≧ β ?
N
Y
340
Tsvent=Tvent- β
350
Tsvent = Tvent
360
RETURN

* NOTICES *

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1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

CLAIMS

[Claim(s)]
[Claim 1] The differential-gear outlet which carries out opening to the dashboard near the vehicle interior-of-a-room side lower part of a windshield, The vent outlet which carries out opening to the crew side side face of said dashboard is provided at least. In the air conditioner for cars which has the mix door which carries out splitting to the air which flows the heat exchanger for cooling, the heat exchanger for heating, and the heat exchanger for heating, and the air to bypass in a duct A dash panel cooling means to cool said dash panel when the temperature of said dash panel turns into beyond predetermined temperature, The air conditioner for cars characterized by providing a windshield cooling means to cool said windshield when the temperature of said windshield turns into beyond predetermined temperature.
[Claim 2] Said dash panel cooling means is an air conditioner for cars according to claim 1 which is the bypass path installed to opening which carries out opening to the downstream of said duct along the lower side face of a dash panel from opening which carries out opening to the duct near the downstream of said heat exchanger for cooling, and is characterized by making open a closing motion means to open and close said opening when the temperature of said dash panel turns into beyond predetermined temperature.
[Claim 3] Said bypass door is an air conditioner for cars according to claim 2 characterized by providing the opening control means to which opening is changed according to the temperature gradient between a dashboard and whenever [vehicle room air temperature].
[Claim 4] Said windshield cooling means is an air conditioner for cars according to claim 1, 2, or 3 characterized by being differential-gear vent blow-off Mohd who does opening of the differential-gear outlet when the temperature of said windshield turns into beyond predetermined temperature at the time of vent blow-off Mohd who does opening of the vent outlet.
[Claim 5] Said dash panel cooling means and said windshield cooling means It is the blow-off direction modification louver driven by the driving means prepared in said differential-gear outlet. An outlet is moved to the location which blows off cold blast along the upper part of a dash panel when the temperature of a dash panel is beyond predetermined temperature. An outlet is moved to the location which blows off cold blast along with a windshield when the temperature of a windshield is beyond predetermined temperature. The air conditioner for cars according to claim 1 characterized by reciprocating between the locations which blow off cold blast along with the location which blows off cold blast along with said dash panel, and said windshield when the temperature of a dash panel is beyond a predetermined value and the temperature of the front panel is beyond a predetermined value.
[Claim 6] Said windshield air conditioning means is the 1st differential-gear outlet formed in said dash panel. And said dash panel cooling means is 2nd differential-gear outlet which carries out opening to said dash panel side. When the temperature of said dash panel is beyond predetermined temperature, while carrying out opening of the 2nd differential-gear outlet by the change-over door, the 1st differential-gear outlet is closed down. When the temperature of said windshield is beyond predetermined temperature, while carrying out opening of the 1st differential-gear outlet by the change-over door, the 2nd differential-gear outlet is closed. The air conditioner for cars according to claim 1

characterized by moving a change-over door to the location which carries out opening of the 1st and 2nd differential-gear outlets when the temperature of said dash panel is beyond a predetermined value and the temperature of said front panel is beyond a predetermined value.
[Claim 7] In A pillar holding the flank of said windshield The cold blast path which two or more outlets which blow off cold blast along with said side glass, and these two or more outlets open for free passage, A side glass cooling means is constituted by closing motion means to open and close this cold blast path. The air conditioner for cars of any one publication of claim 1-6 characterized by opening the downstream of said cold blast path and said duct for free passage when the temperature of said side glass becomes beyond predetermined temperature, and said closing motion means opens.

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] This invention is an air conditioner carried in a car, and relates to what has at least the vent outlet which carries out opening to the differential-gear outlet which carries out opening to the dashboard near the inside lower part of a windshield, and the crew side side face of a dashboard.

[0002]

[Description of the Prior Art] When an open hole is wide opened on the top face of a dashboard, the closing motion damper which can be opened and closed to this open hole is formed and whenever [target blow-off temperature] is in a predetermined temperature requirement, the cold blast just behind an evaporator is made for the air conditioner for cars indicated by JP,5-338434,A to blow off from said open hole, it cools the top face of a dashboard, and reduces the radiant heat from a dashboard. As for the cold blast which blows off from this open hole, cold blast blows off perpendicularly to a car travelling direction along the front face of a dashboard so that clearly also from drawing 4 of this official report.

[0003] The air conditioning system of the automobile indicated by JP,5-185827,A arranges the evaporator of an air-quenching means, and the duct which sends the low-temperature air-conditioning mind cooled there to a division means in the cold radiation panel with which head lining or a medial surface in the car was equipped, constitutes a cold [an air-quenching means-cum-] radiation panel, and radiates low temperature from a cold radiation panel.

[0004]

[Problem(s) to be Solved by the Invention] However, when an instrument panel, a dashboard, etc. are formed by the heat absorbing glass by which dark color systems, such as black and gray, are used from the relation between reflection or a design in many cases, and a windshield is used for reduction of direct rays, the temperature of a windshield also rises by solar radiation. By this, with the radiant heat from a dashboard or a windshield, the air temperature of the vehicle interior of a room is optimal temperature, and even when direct rays do not suit, crew has the fault of sensing a hot flash of heat and a face.

[0005] Although cooling of a dashboard of the air conditioner for cars indicated by JP,5-338434,A is attained to this fault, cooling of a windshield is impossible and cannot prevent fault by the radiant heat from a dashboard and a windshield by the cold radiation panel indicated by JP,5-185827,A.

[0006] Therefore, offering the air conditioner for cars which can prevent efficiently the fault by the radiant heat from a dashboard and a windshield has this invention.

[0007]

[Means for Solving the Problem] Therefore, the differential-gear outlet which carries out opening of this invention to the dashboard near the vehicle interior-of-a-room side lower part of a windshield, The vent outlet which carries out opening to the crew side side face of said dashboard is provided at least. In the air conditioner for cars which has the mix door which carries out splitting to the air which flows the heat exchanger for cooling, the heat exchanger for heating, and the heat exchanger for heating, and the air to bypass in a duct It is in providing a dashboard cooling means to cool said dashboard when the temperature of said dashboard turns into beyond predetermined temperature, and a windshield cooling means to cool said windshield when the temperature of said windshield turns into beyond predetermined temperature.

[0008] Therefore, since a windshield can be cooled with said windshield cooling means when the temperature of a windshield turns into beyond predetermined temperature while cooling a dashboard with a dashboard cooling means according to this invention, when the temperature of a dashboard turns into beyond predetermined temperature, the radiant heat from a windshield and a dashboard can be prevented. In addition, you may make it calculate from an OAT and intensity of radiation whenever [various detecting-signals / which are detected in order to detect the temperature of said dashboard, and the temperature of a windshield by equipping with a direct temperature sensor and to perform air-conditioning control in this case / for example, vehicle room air temperature,]. As for the operation approach, asking from an experiment is desirable.

[0009] Moreover, said dashboard cooling means is a bypass path installed to opening which carries out opening to the downstream of said duct along the lower side face of a dashboard from opening which carries out opening to the duct near the downstream of said heat exchanger for cooling, and when the temperature of said dashboard turns into beyond predetermined temperature, it makes open a closing motion means to open and close said opening.

[0010] Since a pie pass path is wide opened by the closing motion means and cold blast flows from the downstream of the heat exchanger for cooling to a bypass path when the temperature of a dashboard turns into beyond predetermined temperature by this, a dashboard can be cooled from the lower part of a dashboard. In this case, since the temperature of cold blast rises and this cold blast is mixed with the mainstream cold blast within a duct when a dashboard is cooled, it is desirable to consider the effectiveness of the air which passes through a bypass path in a setup of target blow-off air temperature.

[0011] Furthermore, as for said bypass door, it is desirable to provide the opening control means to which opening is changed according to the temperature gradient between a dashboard and whenever [vehicle room air temperature]. By this, the fine control by the temperature gradient between a dashboard and whenever [vehicle room air temperature] is attained.

[0012] Said windshield cooling means may be differential-gear vent blow-off Mohd who does opening of the differential-gear outlet further again, when the temperature of said windshield turns into beyond predetermined temperature at the time of vent blow-off Mohd who does opening of the vent outlet. Since the cold blast which blows off from a vent outlet by having been made to carry out opening of the differential-gear outlet closed by this at the time of the usual air conditioning operation when a windshield becomes beyond predetermined temperature blows off from a differential-gear outlet, cooling of a windshield is attained.

[0013] Moreover, said dashboard cooling means and said windshield cooling means It is the blow-off direction modification louver driven by the driving means prepared in said differential-gear outlet. An outlet is moved to the location which blows off cold blast along the upper part of a dashboard when the temperature of a dashboard is beyond predetermined temperature. An outlet is moved to the location which blows off cold blast along with a windshield when the temperature of a windshield is beyond predetermined temperature. when the temperature of a dashboard is beyond a predetermined value and the temperature of the front panel is beyond a predetermined value, it is the thing which reciprocates between the locations which blow off cold blast along with the location which blows off cold blast along with said dashboard, and said windshield and which may come out and exist.

[0014] By this, when only a windshield is beyond predetermined temperature, cold blast is blown off only to a windshield side, when only a dashboard is beyond predetermined temperature, cold blast is blown off only to a dashboard side, and since it operates so that an outlet may go back and forth between a windshield side and dashboard sides when both temperature is beyond predetermined temperature further, both cooling is attained by the one blow-off direction modification louver.

[0015] Furthermore, said windshield air conditioning means is the 1st differential-gear outlet formed in said dashboard. And said dashboard cooling means is 2nd differential-gear outlet which carries out opening to said dashboard side. When the temperature of said dashboard is beyond predetermined temperature, while carrying out opening of the 2nd differential-gear outlet by the change-over door, the 1st differential-gear outlet is closed down. When the temperature of said windshield is beyond predetermined temperature, while carrying out opening of the 1st differential-gear outlet by the change-over door, the 2nd differential-gear outlet is closed. When the temperature of said dashboard is beyond a predetermined value and the temperature of said front panel is beyond a predetermined value, you may be the object made to move a change-over door to the location which carries out opening of the 1st and 2nd differential-gear outlets.

[0016] To A pillar holding the flank of said windshield further again The cold blast path which two or more outlets which blow off cold blast along with said side glass, and these two or more outlets open for free passage, When a side glass cooling means is constituted, the temperature of said side glass becomes with a closing motion means to open and close this cold blast path, beyond predetermined temperature, and said closing motion means opens, that by which the downstream of said cold blast path and said duct is opened for free passage is desirable. The radiant heat from a side glass can also be prevented by this.

[0017]

[Embodiment of the Invention] Hereafter, a drawing explains the gestalt of implementation of this invention.

[0018] In drawing 1 , the air conditioner 1 for cars is carried in the dashboard 3 of a car 2, and has the differential-gear outlet 5 which is the top face of a dashboard 3 and carries out opening near the lower part of a windshield 4, the vent outlet 6 which carries out opening to the crew side side face of a dashboard 3, and the foot outlet 7 which is the lower part of a dashboard 3 and carries out opening near crew's step.

[0019] It is shown in drawing 2 , and has the open air inlet 11 and the bashful inlet 12 which carry out opening to the maximum upstream of a duct 10, and said air conditioner 1 for cars has the intake door 13 which carries out opening of the open air inlet 11 and the bashful inlet 12 alternatively suitably further. A blower 14 is formed in the lower stream of a river of this intake door 13, the open air or inner mind is attracted from the open air inlet 11 chosen by operation of this blower 14 by said intake door 13, or the bashful inlet 12, and it is ventilated by the downstream of said duct 10. The evaporator 15 as a heat exchanger for cooling is allotted to the lower stream of a river of said blower 14, and the air to pass is cooled on it. Air [that the air cooled by this evaporator 15 is divided into the air which passes the heater core 16 as a heat exchanger for heating by the mix door 17, and the air which bypasses this heater core 16, and is cooled by that downstream], and the heated air are mixed, and the blow-off air of desired temperature is acquired. And the ducts 5A, 6A, and 7A open for free passage are connected with each of said differential-gear outlet 5, said vent outlet 6, and the foot outlet 7, and the mode doors 18A, 18B, and 18C which open and close each duct 5A, 6A, and 7A are formed in the lowest style side of a duct 10.

[0020] And the bypass path 20 bypassed along the bottom side of said dashboard 3 is established in said air conditioner 1 for cars. It carries out opening of the opening 22 of another side of said bypass path 20 to the duct 10 by the side of the bypass of the lower stream of a river of said mix door 17 while carrying out opening of one opening 21 of this bypass path 20 near the downstream of said evaporator 15 of said duct 10. Moreover, bypass doors 23 and 24 are formed in each of said openings 21 and 22. As for these bypass doors 23 and 24, driving with a motor actuator etc. is desirable, and they can adjust finely the amount of cold blast which passes through said bypass path 20 by this from 0 to 100%.

[0021] Hereafter, the gestalt of operation of the 1st of the invention in this application is explained according to the flow chart Fig. of drawing 5 and drawing 6 .

[0022] The flow chart shown by drawing 6 is incorporated about windshield cooling control as a subroutine periodically performed from the Maine control routine as a part of Maine control routine which performs control of the air conditioner 1 for cars, and is periodically performed in accordance with the flow of the Maine control routine.

[0023] In the windshield cooling control started from step 100, it is judged in step 110 whether the temperature gradient between Ti is beyond the predetermined value alpha the windshield temperature Tfg detected by the windshield temperature detection sensor 20 shown in drawing 1 and whenever [vehicle room air temperature]. When temperature with Ti is not beyond the predetermined value alpha the windshield temperature Tfg and whenever [room air temperature] in this judgment, it judges that the radiant heat from a windshield 4 is not large, it progresses to step 120, Mohd of control is usually set up, and return, especially windshield cooling control are not performed by the Maine control routine from step 180.

[0024] On the other hand, since it can judge that dysphoria is sensed with the radiant heat from a windshield 4 when judged with a temperature gradient with Ti being beyond the predetermined value alpha the windshield temperature Tfg and whenever [room air temperature], by the judgment of step 110, it progresses to step 130 and it is judged whether the temperature gradient of the windshield temperature Tfg and OAT Ta is beyond the predetermined value beta. In this judgment, when [whose a temperature gradient is beyond the predetermined value beta] judged Since it can judge with the temperature rise of a windshield 4 being quite higher than OAT Ta While mode door 18A from which progress to step 140, opening of the differential-gear outlet 5 is carried out, and it is made for cold blast to blow off along with a windshield 4 carries out opening A part for the temperature rise by the heat exchange according [the differential-gear blow-off air temperature Tdef which blows off from the differential-gear outlet 5] to a windshield 4 is considered, and low temperature is set up by the predetermined value beta from the vent blow-off air temperature Tvent. Specifically by change of the door-opening condition of mode door 18B which opens and closes vent blow-off duct 6A, and mode door 18A which open and close differential-gear blow-off duct 5A, and the location of the mix door 17 and the refrigeration capacity of an evaporator 15 the amount of cold blast contained in the air which passes vent blow-off duct 6A in the amount of cold blast contained in the air which passes differential-gear blow-off duct 5A -- a predetermined value -- predetermined price-reduction ****** of the differential-gear blow-off air temperature Tdef can be carried out from the vent blow-off air temperature Tvent by making [many] it. By this, the differential-gear blow-off air temperature Tdef rises by heat exchange with a windshield 4, and serves as Tvent whenever [vent blow-off temperature]. And it recurs from step 180 to the Maine control routine, performing windshield cooling control by step 140.

[0025] In the judgment of step 120 moreover, when the temperature gradient of the windshield temperature Tfg and OAT Ta is smaller than the predetermined value beta Mode door 18A is opened so that the air which progressed to step 150 and was set as the same temperature Tvent as vent blow-off air from the differential-gear outlet 5 may be blown off. It progresses to step 160 and judges whether it is beyond the predetermined value gamma with a larger temperature gradient with Ti than said predetermined value alpha the windshield temperature Tfg and whenever [vehicle room air temperature]. It recurs from step 180 to the Maine control routine, performing windshield cooling control of step 180 to said step 150 in this judgment, when said temperature gradient is smaller than the predetermined value gamma. By this, the radiant heat Fg from a windshield 4 can be prevented.

[0026] Moreover, in the judgment of said step 160, when said temperature gradient is beyond the predetermined value gamma, since the temperature gradient of the windshield temperature Tfg and the vehicle indoor air temperature Ti is large, it progresses to step 170, and opening of mode door 18A is enlarged, the airflow of differential-gear blow-off air is increased, and it recurs from step 180 to the Maine control routine. In addition, although the temperature sensor 20 detected windshield temperature, you may make it ask by the operation in the above-mentioned windshield cooling control based on Ti, OAT Ta, and intensity of radiation whenever [vehicle room air temperature].

[0027] Dashboard cooling control shown by drawing 7 is performed in parallel to the above-mentioned windshield cooling control, and is performed as control of the bypass doors 23 and 24 mainly prepared in the bypass path 20. The judgment of whether the temperature gradient of Ti is more than predetermined value alpha' (alpha'>alpha) whenever [dashboard ** / which was detected by the temperature sensor 19 which shows the bypass door control started from step 200 to drawing 1 in step 210 / Td, and vehicle room air temperature] is performed. In this judgment, when said temperature gradient is smaller than a predetermined value (alpha'), it progresses to step 220, bypass doors 23 and 24

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TECHNICAL FIELD

[The technical field to which invention belongs] This invention is an air conditioner carried in a car, and relates to what has at least the vent outlet which carries out opening to the differential-gear outlet which carries out opening to the dashboard near the inside lower part of a windshield, and the crew side side face of a dashboard.

[Translation done.]

are closed, and it recurs from step 240 to the Maine control routine.
[0028] Moreover, in the judgment of 210 described a front, since it can judge that crew senses dysphoria with the radiant heat from a dashboard 3 when judged with a temperature gradient being more than predetermined value alpha', control of bypass doors 23 and 24 is performed so that it may progress to step 230 and said dashboard temperature Td may become equal to whenever [room air temperature]. The radiant heat Fd from a dashboard 3 can be prevented by this.
[0029] The gestalt of the 2nd operation shown in drawing 3 forms the cylinder-like blow-off direction modification louver 30 in said differential-gear outlet. This blow-off direction modification louver 30 is a thing possessing said differential-gear blow-off duct 5A, the inhalation opening 32 open for free passage, and the outlet 31 that moves by the driving means 33 of a motor etc. In the gestalt of this 2nd operation, by the windshield cooling control shown by drawing 5 , it replaces with control of said step 140 or step 150, and as shown by drawing 3 (b), the outlet 31 of the blow-off direction modification louver 30 is rotated so that an outlet 31 may be up suitable. By this, differential-gear blow-off air blows up along with the inside of a windshield 4, and cools said windshield 4.
[0030] Moreover, in the gestalt of this 2nd operation, by the dashboard cooling control shown by drawing 7 , when a temperature gradient with Ti is more than predetermined value alpha' the dashboard temperature Td and whenever [vehicle room air temperature] in the judgment of step 210, it replaces with control of step 230, and as shown by drawing 3 (a), the location of the outlet 31 of the blow-off direction modification louver 30 is rotated so that it may be suitable in the direction in which an outlet 31 meets dash baud 3 DO. By this, differential-gear blow-off air blows off along with a dashboard 3, and cools a dashboard 3.
[0031] Moreover, when windshield cooling control and dashboard cooling control are realized in coincidence, the outlet 31 of the aforementioned blow-off direction modification louver 30 reciprocates between the locations of an outlet 31 shown by the location and drawing 3 (b) of the outlet 31 shown by said drawing 3 (a). By this, the same effectiveness as the gestalt of the 1st operation mentioned above can be done so.
[0032] The gestalt of the 3rd operation forms the closing motion door 53 which opens and closes suitably 1st path 51A which results in the 1st outlet 51, and 2nd path 52A which results in the 2nd outlet 52 alternatively while dividing the lowest style side of differential-gear blow-off duct 5A into the 1st outlet 51 which is shown by drawing 4 and which carried out opening to the windshield 4 side, and the 2nd outlet 52 which carried out opening to the dashboard 3 side. By this, it replaces with control of said step 140 or step 150 in the windshield cooling control shown by drawing 5 in the gestalt of this 3rd operation, and the closing motion door 53 moves so that only the 1st outlet 51 may carry out opening. By this, differential-gear blow-off air blows up along with the inside of a windshield 4, and cools said windshield 4.
[0033] Moreover, in the gestalt of this 3rd operation, by the dashboard cooling control shown by drawing 7 , when a temperature gradient with Ti is more than predetermined value alpha' the dashboard temperature Td and whenever [vehicle room air temperature] in the judgment of step 210, it replaces with control of step 230, and the closing motion door 53 moves so that only the 2nd outlet 52 may carry out opening. As drawing 3 (a) shows the location of the outlet 31 of the blow-off direction modification louver 30, by this, differential-gear blow-off air blows off along with a dashboard 3, and cools a dashboard 3.
[0034] Moreover, when windshield cooling control and dashboard cooling control are realized in coincidence, said closing motion door 53 moves the 1st and 2nd outlets 51 and 52 to the location which carries out opening. By this, the same effectiveness as the gestalt of the 1st operation mentioned above can be done so.
[0035] Furthermore, the above-mentioned air conditioner 1 for cars has the edge of vent blow-off duct 6A which has the side vent outlet 61 located in the both ends of a dashboard 3, and a side glass cooling system open for free passage, as drawing 5 (a) and (b) show. The cold blast duct 62 which this side glass cooling system opens for free passage with said vent blow-off duct 6A, The cold blast path 64 formed between the frames of the A pillar 66 and interiors which support a door 71 while holding the flank of

said windshield, It is constituted by two or more outlets 65 which carry out opening to this cold blast path 64 along with the side glass 70 side of said A pillar 66, and blow-off control is made by the closing motion door 63 which opens and closes between said cold blast duct 62 and said vent blow-off duct 6A.

[0036] Moreover, side glass cooling control is performed as side vent temperature control, as shown by the flow chart of drawing 8 . The judgment of whether temperature with Ti is beyond the predetermined value alpha the side glass temperature Tsg which the side vent temperature control performed from this step 300 was first detected by the temperature sensor in step 310, or was computed by the operation, and whenever [vehicle room air temperature] is performed. In this judgment, when said temperature gradient is not beyond the predetermined value alpha, it progresses to step 320, said closing motion door 63 is closed, the usual control is set up, and site glass cooling control is not performed but is recurred from step 360 to the Maine control routine.

[0037] Furthermore, when a temperature gradient with Ti is beyond the predetermined value alpha the side glass temperature Tsg and whenever [vehicle room air temperature] in the judgment of said step 310, it progresses to step 330 and the judgment of whether the temperature gradient of the side glass temperature Tsg and OAT Ta is beyond the predetermined value beta is performed. In this judgment, when judged with said temperature gradient being beyond the predetermined value beta, while progressing to step 340 and setting up said closing motion door 63, whenever [side vent blow-off temperature], Tsvent is [whenever / vent blow-off temperature] lower than Tvent by the predetermined value beta, and is set up. Heat exchange of the temperature of side glass blow-off air is carried out between the side glasses 70 by this, and it serves as Tvent whenever [predetermined blow-off temperature] by it.

[0038] Moreover, in the judgment of said step 330, when judged with said temperature gradient not being beyond the predetermined value beta, while progressing to step 350 and opening said closing motion door 63, Tsvent is set [whenever / side vent blow-off temperature] as Tvent whenever [vent blow-off temperature]. By this, since side glass can be cooled, the radiant heat from side glass can be prevented.

[0039]

[Effect of the Invention] Since a dashboard and a windshield, and the displeasure by the radiant heat from side glass can be further prevented according to this invention as explained above, the amenity of the air-conditioning environment of the vehicle interior of a room can be raised. Moreover, since it becomes unnecessary to lower a room temperature beyond the need in order to cancel the dysphoria by radiant heat, energy saving can be attained.

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EFFECT OF THE INVENTION

[Effect of the Invention] Since a dashboard and a windshield, and the displeasure by the radiant heat from side glass can be further prevented according to this invention as explained above, the amenity of the air-conditioning environment of the vehicle interior of a room can be raised. Moreover, since it becomes unnecessary to lower a room temperature beyond the need in order to cancel the dysphoria by radiant heat, energy saving can be attained.

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] However, when an instrument panel, a dashboard, etc. are formed by the heat absorbing glass by which dark color systems, such as black and gray, are used from the relation between reflection or a design in many cases, and a windshield is used for reduction of direct rays, the temperature of a windshield also rises by solar radiation. By this, with the radiant heat from a dashboard or a windshield, the air temperature of the vehicle interior of a room is optimal temperature, and even when direct rays do not suit, crew has the fault of sensing a hot flash of heat and a face.
[0005] Although cooling of a dashboard of the air conditioner for cars indicated by JP,5-338434,A is attained to this fault, cooling of a windshield is impossible and cannot prevent fault by the radiant heat from a dashboard and a windshield by the cold radiation panel indicated by JP,5-185827,A.
[0006] Therefore, offering the air conditioner for cars which can prevent efficiently the fault by the radiant heat from a dashboard and a windshield has this invention.

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PRIOR ART

[Description of the Prior Art] When an open hole is wide opened on the top face of a dashboard, the closing motion damper which can be opened and closed to this open hole is formed and whenever [target blow-off temperature] is in a predetermined temperature requirement, the cold blast just behind an evaporator is made for the air conditioner for cars indicated by JP,5-338434,A to blow off from said open hole, it cools the top face of a dashboard, and reduces the radiant heat from a dashboard. As for the cold blast which blows off from this open hole, cold blast blows off perpendicularly to a car travelling direction along the front face of a dashboard so that clearly also from drawing 4 of this official report.
[0003] The air conditioning system of the automobile indicated by JP,5-185827,A arranges the evaporator of an air-quenching means, and the duct which sends the low-temperature air-conditioning mind cooled there to a division means in the cold radiation panel with which head lining or a medial surface in the car was equipped, constitutes a cold [an air-quenching means-cum-] radiation panel, and radiates low temperature from a cold radiation panel.

[Translation done.]

windshield becomes beyond predetermined temperature blows off from a differential-gear outlet, cooling of a windshield is attained.

[0013] Moreover, said dashboard cooling means and said windshield cooling means It is the blow-off direction modification louver driven by the driving means prepared in said differential-gear outlet. An outlet is moved to the location which blows off cold blast along the upper part of a dashboard when the temperature of a dashboard is beyond predetermined temperature. An outlet is moved to the location which blows off cold blast along with a windshield when the temperature of a windshield is beyond predetermined temperature. when the temperature of a dashboard is beyond a predetermined value and the temperature of the front panel is beyond a predetermined value, it is the thing which reciprocates between the locations which blow off cold blast along with the location which blows off cold blast along with said dashboard, and said windshield and which may come out and exist.

[0014] By this, when only a windshield is beyond predetermined temperature, cold blast is blown off only to a windshield side, when only a dashboard is beyond predetermined temperature, cold blast is blown off only to a dashboard side, and since it operates so that an outlet may go back and forth between a windshield side and dashboard sides when both temperature is beyond predetermined temperature further, both cooling is attained by the one blow-off direction modification louver.

[0015] Furthermore, said windshield air conditioning means is the 1st differential-gear outlet formed in said dashboard. And said dashboard cooling means is 2nd differential-gear outlet which carries out opening to said dashboard side. When the temperature of said dashboard is beyond predetermined temperature, while carrying out opening of the 2nd differential-gear outlet by the change-over door, the 1st differential-gear outlet is closed down. When the temperature of said windshield is beyond predetermined temperature, while carrying out opening of the 1st differential-gear outlet by the change-over door, the 2nd differential-gear outlet is closed. When the temperature of said dashboard is beyond a predetermined value and the temperature of said front panel is beyond a predetermined value, you may be the object made to move a change-over door to the location which carries out opening of the 1st and 2nd differential-gear outlets.

[0016] To A pillar holding the flank of said windshield further again The cold blast path which two or more outlets which blow off cold blast along with said side glass, and these two or more outlets open for free passage, When a side glass cooling means is constituted, the temperature of said side glass becomes with a closing motion means to open and close this cold blast path, beyond predetermined temperature, and said closing motion means opens, that by which the downstream of said cold blast path and said duct is opened for free passage is desirable. The radiant heat from a side glass can also be prevented by this.

[0017]

[Embodiment of the Invention] Hereafter, a drawing explains the gestalt of implementation of this invention.

[0018] In drawing 1 , the air conditioner 1 for cars is carried in the dashboard 3 of a car 2, and has the differential-gear outlet 5 which is the top face of a dashboard 3 and carries out opening near the lower part of a windshield 4, the vent outlet 6 which carries out opening to the crew side side face of a dashboard 3, and the foot outlet 7 which is the lower part of a dashboard 3 and carries out opening near crew's step.

[0019] It is shown in drawing 2 , and has the open air inlet 11 and the bashful inlet 12 which carry out opening to the maximum upstream of a duct 10, and said air conditioner 1 for cars has the intake door 13 which carries out opening of the open air inlet 11 and the bashful inlet 12 alternatively suitably further. A blower 14 is formed in the lower stream of a river of this intake door 13, the open air or inner mind is attracted from the open air inlet 11 chosen by operation of this blower 14 by said intake door 13, or the bashful inlet 12, and it is ventilated by the downstream of said duct 10. The evaporator 15 as a heat exchanger for cooling is allotted to the lower stream of a river of said blower 14, and the air to pass is cooled on it. Air [that the air cooled by this evaporator 15 is divided into the air which passes the heater core 16 as a heat exchanger for heating by the mix door 17, and the air which bypasses this heater core 16, and is cooled by that downstream], and the heated air are mixed, and the blow-off air of desired

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MEANS

[Means for Solving the Problem] Therefore, the differential-gear outlet which carries out opening of this invention to the dashboard near the vehicle interior-of-a-room side lower part of a windshield, The vent outlet which carries out opening to the crew side side face of said dashboard is provided at least. In the air conditioner for cars which has the mix door which carries out splitting to the air which flows the heat exchanger for cooling, the heat exchanger for heating, and the heat exchanger for heating, and the air to bypass in a duct It is in providing a dashboard cooling means to cool said dashboard when the temperature of said dashboard turns into beyond predetermined temperature, and a windshield cooling means to cool said windshield when the temperature of said windshield turns into beyond predetermined temperature.
[0008] Therefore, since a windshield can be cooled with said windshield cooling means when the temperature of a windshield turns into beyond predetermined temperature while cooling a dashboard with a dashboard cooling means according to this invention, when the temperature of a dashboard turns into beyond predetermined temperature, the radiant heat from a windshield and a dashboard can be prevented. In addition, you may make it calculate from an OAT and intensity of radiation whenever [various detecting-signals / which are detected in order to detect the temperature of said dashboard, and the temperature of a windshield by equipping with a direct temperature sensor and to perform air-conditioning control in this case / for example, vehicle room air temperature,]. As for the operation approach, asking from an experiment is desirable.
[0009] Moreover, said dashboard cooling means is a bypass path installed to opening which carries out opening to the downstream of said duct along the lower side face of a dashboard from opening which carries out opening to the duct near the downstream of said heat exchanger for cooling, and when the temperature of said dashboard turns into beyond predetermined temperature, it makes open a closing motion means to open and close said opening.
[0010] Since a pie pass path is wide opened by the closing motion means and cold blast flows from the downstream of the heat exchanger for cooling to a bypass path when the temperature of a dashboard turns into beyond predetermined temperature by this, a dashboard can be cooled from the lower part of a dashboard. In this case, since the temperature of cold blast rises and this cold blast is mixed with the mainstream cold blast within a duct when a dashboard is cooled, it is desirable to consider the effectiveness of the air which passes through a bypass path in a setup of target blow-off air temperature.
[0011] Furthermore, as for said bypass door, it is desirable to provide the opening control means to which opening is changed according to the temperature gradient between a dashboard and whenever [vehicle room air temperature]. By this, the fine control by the temperature gradient between a dashboard and whenever [vehicle room air temperature] is attained.
[0012] Said windshield cooling means may be differential-gear vent blow-off Mohd who does opening of the differential-gear outlet further again, when the temperature of said windshield turns into beyond predetermined temperature at the time of vent blow-off Mohd who does opening of the vent outlet. Since the cold blast which blows off from a vent outlet by having been made to carry out opening of the differential-gear outlet closed by this at the time of the usual air conditioning operation when a

predetermined value alpha the windshield temperature Tfg and whenever [vehicle room air temperature]. It recurs from step 180 to the Maine control routine, performing windshield cooling control of step 180 to said step 150 in this judgment, when said temperature gradient is smaller than the predetermined value gamma. By this, the radiant heat Fg from a windshield 4 can be prevented.

[0026] Moreover, in the judgment of said step 160, when said temperature gradient is beyond the predetermined value gamma, since the temperature gradient of the windshield temperature Tfg and the vehicle indoor air temperature Ti is large, it progresses to step 170, and opening of mode door 18A is enlarged, the airflow of differential-gear blow-off air is increased, and it recurs from step 180 to the Maine control routine. In addition, although the temperature sensor 20 detected windshield temperature, you may make it ask by the operation in the above-mentioned windshield cooling control based on Ti, OAT Ta, and intensity of radiation whenever [vehicle room air temperature].

[0027] Dashboard cooling control shown by drawing 7 is performed in parallel to the above-mentioned windshield cooling control, and is performed as control of the bypass doors 23 and 24 mainly prepared in the bypass path 20. The judgment of whether the temperature gradient of Ti is more than predetermined value alpha' (alpha'>alpha) whenever [dashboard ** / which was detected by the temperature sensor 19 which shows the bypass door control started from step 200 to drawing 1 in step 210 / Td, and vehicle room air temperature] is performed. In this judgment, when said temperature gradient is smaller than a predetermined value (alpha'), it progresses to step 220, bypass doors 23 and 24 are closed, and it recurs from step 240 to the Maine control routine.

[0028] Moreover, in the judgment of 210 described a front, since it can judge that crew senses dysphoria with the radiant heat from a dashboard 3 when judged with a temperature gradient being more than predetermined value alpha', control of bypass doors 23 and 24 is performed so that it may progress to step 230 and said dashboard temperature Td may become equal to whenever [room air temperature]. The radiant heat Fd from a dashboard 3 can be prevented by this.

[0029] The gestalt of the 2nd operation shown in drawing 3 forms the cylinder-like blow-off direction modification louver 30 in said differential-gear outlet. This blow-off direction modification louver 30 is a thing possessing said differential-gear blow-off duct 5A, the inhalation opening 32 open for free passage, and the outlet 31 that moves by the driving means 33 of a motor etc. In the gestalt of this 2nd operation, by the windshield cooling control shown by drawing 5 , it replaces with control of said step 140 or step 150, and as shown by drawing 3 (b), the outlet 31 of the blow-off direction modification louver 30 is rotated so that an outlet 31 may be up suitable. By this, differential-gear blow-off air blows up along with the inside of a windshield 4, and cools said windshield 4.

[0030] Moreover, in the gestalt of this 2nd operation, by the dashboard cooling control shown by drawing 7 , when a temperature gradient with Ti is more than predetermined value alpha' the dashboard temperature Td and whenever [vehicle room air temperature] in the judgment of step 210, it replaces with control of step 230, and as shown by drawing 3 (a), the location of the outlet 31 of the blow-off direction modification louver 30 is rotated so that it may be suitable in the direction in which an outlet 31 meets dash baud 3 DO. By this, differential-gear blow-off air blows off along with a dashboard 3, and cools a dashboard 3.

[0031] Moreover, when windshield cooling control and dashboard cooling control are realized in coincidence, the outlet 31 of the aforementioned blow-off direction modification louver 30 reciprocates between the locations of an outlet 31 shown by the location and drawing 3 (b) of the outlet 31 shown by said drawing 3 (a). By this, the same effectiveness as the gestalt of the 1st operation mentioned above can be done so.

[0032] The gestalt of the 3rd operation forms the closing motion door 53 which opens and closes suitably 1st path 51A which results in the 1st outlet 51, and 2nd path 52A which results in the 2nd outlet 52 alternatively while dividing the lowest style side of differential-gear blow-off duct 5A into the 1st outlet 51 which is shown by drawing 4 and which carried out opening to the windshield 4 side, and the 2nd outlet 52 which carried out opening to the dashboard 3 side. By this, it replaces with control of said step 140 or step 150 in the windshield cooling control shown by drawing 5 in the gestalt of this 3rd operation, and the closing motion door 53 moves so that only the 1st outlet 51 may carry out opening.

By this, differential-gear blow-off air blows up along with the inside of a windshield 4, and cools said windshield 4.

[0033] Moreover, in the gestalt of this 3rd operation, by the dashboard cooling control shown by drawing 7 , when a temperature gradient with Ti is more than predetermined value alpha' the dashboard temperature Td and whenever [vehicle room air temperature] in the judgment of step 210, it replaces with control of step 230, and the closing motion door 53 moves so that only the 2nd outlet 52 may carry out opening. As drawing 3 (a) shows the location of the outlet 31 of the blow-off direction modification louver 30, by this, differential-gear blow-off air blows off along with a dashboard 3, and cools a dashboard 3.

[0034] Moreover, when windshield cooling control and dashboard cooling control are realized in coincidence, said closing motion door 53 moves the 1st and 2nd outlets 51 and 52 to the location which carries out opening. By this, the same effectiveness as the gestalt of the 1st operation mentioned above can be done so.

[0035] Furthermore, the above-mentioned air conditioner 1 for cars has the edge of vent blow-off duct 6A which has the side vent outlet 61 located in the both ends of a dashboard 3, and a side glass cooling system open for free passage, as drawing 5 (a) and (b) show. The cold blast duct 62 which this side glass cooling system opens for free passage with said vent blow-off duct 6A, The cold blast path 64 formed between the frames of the A pillar 66 and interiors which support a door 71 while holding the flank of said windshield, It is constituted by two or more outlets 65 which carry out opening to this cold blast path 64 along with the side glass 70 side of said A pillar 66, and blow-off control is made by the closing motion door 63 which opens and closes between said cold blast duct 62 and said vent blow-off duct 6A.

[0036] Moreover, side glass cooling control is performed as side vent temperature control, as shown by the flow chart of drawing 8 . The judgment of whether temperature with Ti is beyond the predetermined value alpha the side glass temperature Tsg which the side vent temperature control performed from this step 300 was first detected by the temperature sensor in step 310, or was computed by the operation, and whenever [vehicle room air temperature] is performed. In this judgment, when said temperature gradient is not beyond the predetermined value alpha, it progresses to step 320, said closing motion door 63 is closed, the usual control is set up, and site glass cooling control is not performed but is recurred from step 360 to the Maine control routine.

[0037] Furthermore, when a temperature gradient with Ti is beyond the predetermined value alpha the side glass temperature Tsg and whenever [vehicle room air temperature] in the judgment of said step 310, it progresses to step 330 and the judgment of whether the temperature gradient of the side glass temperature Tsg and OAT Ta is beyond the predetermined value beta is performed. In this judgment, when judged with said temperature gradient being beyond the predetermined value beta, while progressing to step 340 and setting up said closing motion door 63, whenever [side vent blow-off temperature], Tsvent is [whenever / vent blow-off temperature] lower than Tvent by the predetermined value beta, and is set up. Heat exchange of the temperature of side glass blow-off air is carried out between the side glasses 70 by this, and it serves as Tvent whenever [predetermined blow-off temperature] by it.

[0038] Moreover, in the judgment of said step 330, when judged with said temperature gradient not being beyond the predetermined value beta, while progressing to step 350 and opening said closing motion door 63, Tsvent is set [whenever / side vent blow-off temperature] as Tvent whenever [vent blow-off temperature]. By this, since side glass can be cooled, the radiant heat from side glass can be prevented.

[Translation done.]

temperature is acquired. And the ducts 5A, 6A, and 7A open for free passage are connected with each of said differential-gear outlet 5, said vent outlet 6, and the foot outlet 7, and the mode doors 18A, 18B, and 18C which open and close each duct 5A, 6A, and 7A are formed in the lowest style side of a duct 10.

[0020] And the bypass path 20 bypassed along the bottom side of said dashboard 3 is established in said air conditioner 1 for cars. It carries out opening of the opening 22 of another side of said bypass path 20 to the duct 10 by the side of the bypass of the lower stream of a river of said mix door 17 while carrying out opening of one opening 21 of this bypass path 20 near the downstream of said evaporator 15 of said duct 10. Moreover, bypass doors 23 and 24 are formed in each of said openings 21 and 22. As for these bypass doors 23 and 24, driving with a motor actuator etc. is desirable, and they can adjust finely the amount of cold blast which passes through said bypass path 20 by this from 0 to 100%.

[0021] Hereafter, the gestalt of operation of the 1st of the invention in this application is explained according to the flow chart Fig. of drawing 5 and drawing 6 .

[0022] The flow chart shown by drawing 6 is incorporated about windshield cooling control as a subroutine periodically performed from the Maine control routine as a part of Maine control routine which performs control of the air conditioner 1 for cars, and is periodically performed in accordance with the flow of the Maine control routine.

[0023] In the windshield cooling control started from step 100, it is judged in step 110 whether the temperature gradient between Ti is beyond the predetermined value alpha the windshield temperature Tfg detected by the windshield temperature detection sensor 20 shown in drawing 1 and whenever [vehicle room air temperature]. When temperature with Ti is not beyond the predetermined value alpha the windshield temperature Tfg and whenever [room air temperature] in this judgment, it judges that the radiant heat from a windshield 4 is not large, it progresses to step 120, Mohd of control is usually set up, and return, especially windshield cooling control are not performed by the Maine control routine from step 180.

[0024] On the other hand, since it can judge that dysphoria is sensed with the radiant heat from a windshield 4 when judged with a temperature gradient with Ti being beyond the predetermined value alpha the windshield temperature Tfg and whenever [room air temperature], by the judgment of step 110, it progresses to step 130 and it is judged whether the temperature gradient of the windshield temperature Tfg and OAT Ta is beyond the predetermined value beta. In this judgment, when [whose a temperature gradient is beyond the predetermined value beta] judged Since it can judge with the temperature rise of a windshield 4 being quite higher than OAT Ta While mode door 18A from which progress to step 140, opening of the differential-gear outlet 5 is carried out, and it is made for cold blast to blow off along with a windshield 4 carries out opening A part for the temperature rise by the heat exchange according [the differential-gear blow-off air temperature Tdef which blows off from the differential-gear outlet 5] to a windshield 4 is considered, and low temperature is set up by the predetermined value beta from the vent blow-off air temperature Tvent. Specifically by change of the door-opening condition of mode door 18B which opens and closes vent blow-off duct 6A, and mode door 18A which open and close differential-gear blow-off duct 5A, and the location of the mix door 17 and the refrigeration capacity of an evaporator 15 the amount of cold blast contained in the air which passes vent blow-off duct 6A in the amount of cold blast contained in the air which passes differential-gear blow-off duct 5A -- a predetermined value -- predetermined price-reduction ****** of the differential-gear blow-off air temperature Tdef can be carried out from the vent blow-off air temperature Tvent by making [many] it. By this, the differential-gear blow-off air temperature Tdef rises by heat exchange with a windshield 4, and serves as Tvent whenever [vent blow-off temperature]. And it recurs from step 180 to the Maine control routine, performing windshield cooling control by step 140.

[0025] In the judgment of step 120 moreover, when the temperature gradient of the windshield temperature Tfg and OAT Ta is smaller than the predetermined value beta Mode door 18A is opened so that the air which progressed to step 150 and was set as the same temperature Tvent as vent blow-off air from the differential-gear outlet 5 may be blown off. It progresses to step 160 and judges whether it is beyond the predetermined value gamma with a larger temperature gradient with Ti than said

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] It is an explanatory view explaining the loading situation and environment of the air conditioner for cars concerning the invention in this application.
[Drawing 2] It is the schematic diagram having shown the outline of the air conditioner for cars concerning the gestalt of operation of the 1st of the invention in this application.
[Drawing 3] It is what showed the configuration of the blow-off direction change-over louver concerning the gestalt of operation of the 2nd of the invention in this application, and (a) shows the condition at the time of dashboard cooling control, and (b) shows the condition at the time of windshield cooling control.
[Drawing 4] It is the explanatory view having shown the configuration near [concerning the gestalt of operation of the 3rd of the invention in this application] the blow-off section.
[Drawing 5] It is a thing explaining the configuration of a side glass cooling system, and (a) is the outline block diagram and (b) is the explanatory view in which it was shown near the A pillar.
[Drawing 6] It is the flow chart Fig. showing windshield cooling control.
[Drawing 7] It is the flow chart Fig. showing the bypass door control as dashboard cooling control.
[Drawing 8] It is the flow chart Fig. showing the side vent temperature control as side glass cooling control.
[Description of Notations]

1	Air Conditioner for Cars
2	Car
3	Dashboard
4	Windshield
5	Differential-Gear Outlet
6	Vent Outlet
10	Duct
15	Evaporator
16	Heater Core
17	Mix Door
18A, 18B, 18C	Mode door
20	Bypass Door
30	The Blow-Off Direction Change-over Louver
51	1st Outlet
52	2nd Outlet
53	Change-over Door
61	Side Vent Outlet
62	Cold Blast Duct
64	Cold Blast Path
66	A Pillar

[Translation done.]

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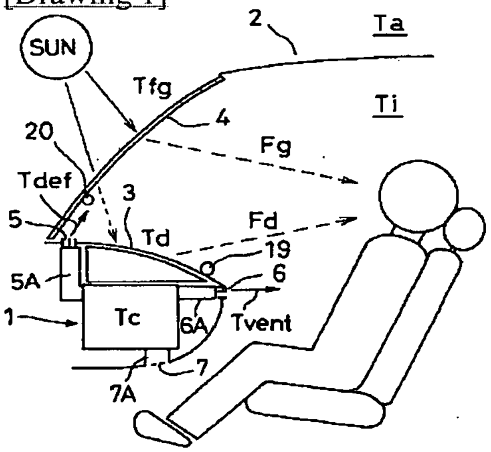
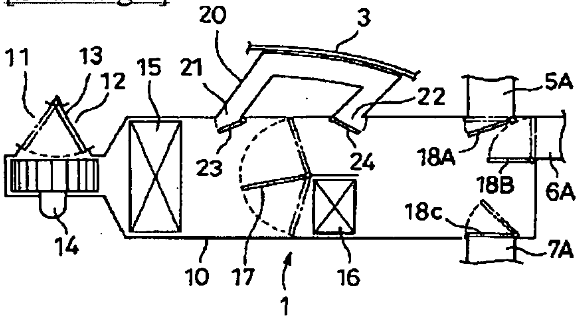
DRAWINGS

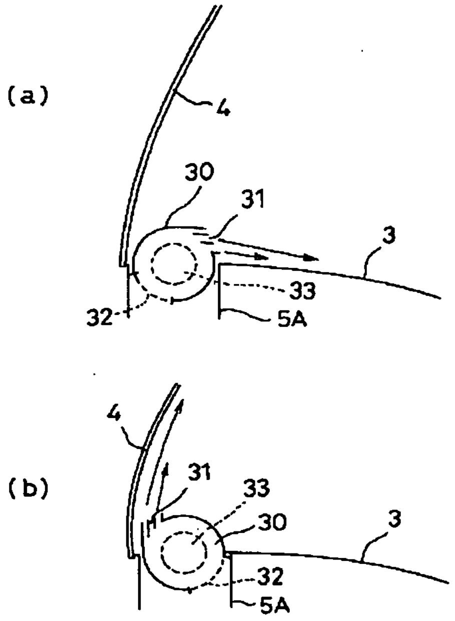
[Drawing 1]



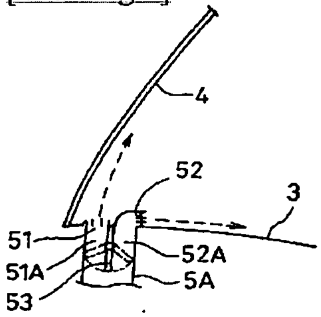
[Drawing 2]



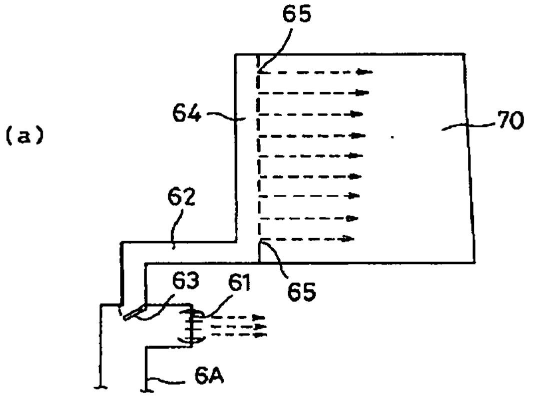
[Drawing 3]

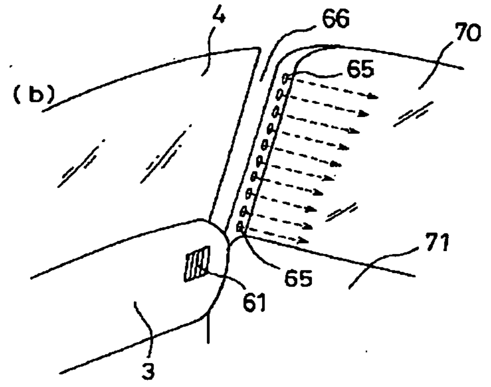


[Drawing 4]

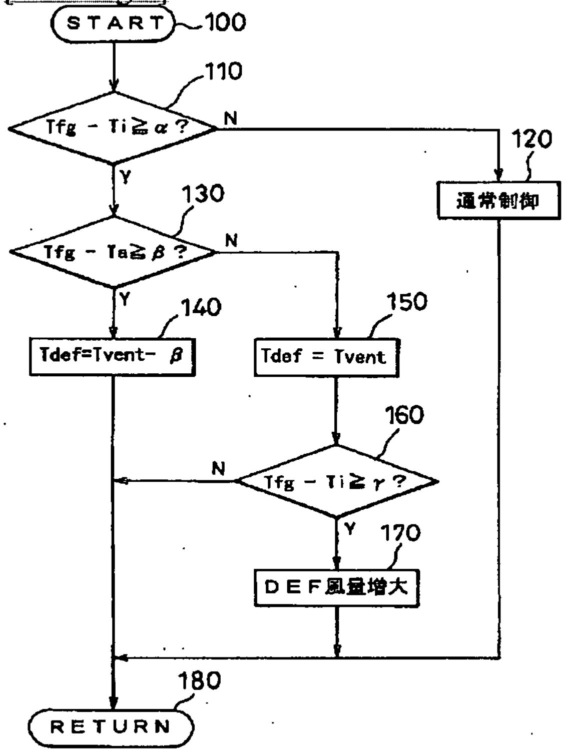


[Drawing 5]

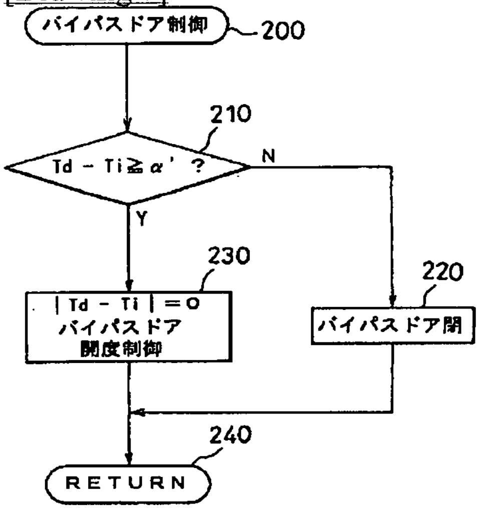

(a)
6A


(b)

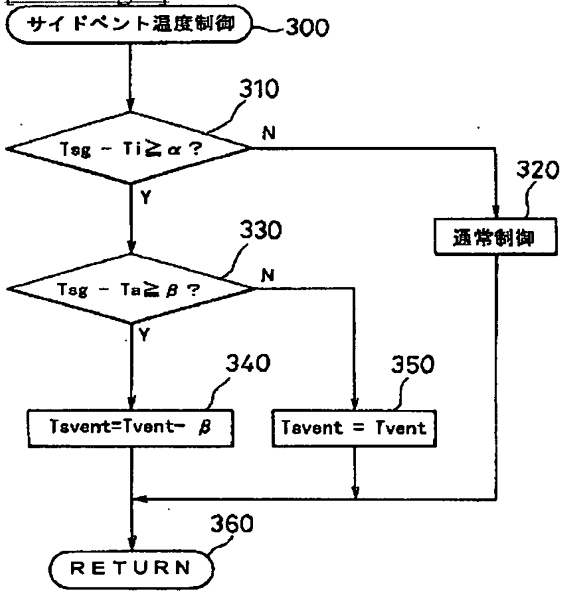
[Drawing 6]


START
100
110
Tfg − Ti ≧ α ?
N
120
通常制御
Y
130
Tfg − Ta ≧ β ?
N
Y
140
Tdef=Tvent− β
150
Tdef = Tvent
160
N
Tfg − Ti ≧ γ ?
Y
170
DEF風量増大
180
RETURN

[Drawing 7]



[Drawing 8]



[Translation done.]